Cambridge Urban Forest Master Plan

UFMP Public Meeting #3: Technical Report

November 12, 2019
SUMMARY OF TECHNICAL REPORT

NEXT STEPS

Q & A

OPEN HOUSE
SUMMARY OF TECHNICAL REPORT

NEXT STEPS

Q & A

OPEN HOUSE
URBAN FOREST MASTER PLAN

Process overview

Builds upon findings of the CCVA

Attempts to deepen the City’s understanding of the anticipated risks to the urban forest

Proposes strategies that support goals of CCPR: building infrastructural, economic, and social resilience that integrates the built and natural environments.

Task Force met 12 times during 2018-2019 to review progress, pose questions, and provide advice to the consultant team, and the interaction with the Task Force has significantly shaped the content of this report, the approach to the subject, and the components of the response strategies.

UFMP is as a unique project, one that other communities are looking to emulate in planning for the future
### TASK FORCE MEMBERS

<table>
<thead>
<tr>
<th>Barbara Murphy-Warrington, Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Louise Weed, Resident</td>
</tr>
<tr>
<td>Caitlin McDonough Mackenzie, Resident</td>
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<td>Ahron Lerman, Resident</td>
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<td>Kathleen Fitzgerald, Resident</td>
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<td>Tessa Mae Buono, Resident</td>
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<td>Elena Saporta, Resident</td>
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<td>Randa Ghattas, Resident</td>
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<tr>
<td>Lena Jean Nahan, Resident</td>
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<tr>
<td>Conrad Crawford, Resident</td>
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<tr>
<td>Maggie Booz, Resident, CPP Co-chair</td>
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<tr>
<td>Florrie Wescoat, Resident, CPP Co-chair</td>
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<tr>
<td>Megan Nichols Tomkins, Representative of the Chamber of Commerce</td>
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<tr>
<td>Caitlin Tamposi, Representative of the Chamber of Commerce (former TF member)</td>
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<tr>
<td>Laura Tenny, MIT Representative</td>
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<tr>
<td>Mark Verkennis, Harvard University Representative</td>
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<tr>
<td>Tom Evans, Cambridge Redevelopment Authority Representative</td>
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<tr>
<td>Joe Bendar, Cambridge Housing Authority Representative</td>
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<tr>
<td>Michael Johnston, Cambridge Housing Authority Representative (former TF member)</td>
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</tbody>
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WHAT DO TREES MEAN TO US?
FINDINGS
Average canopy loss has been 16.4 acres per year since 2009

2009 — 30%
2018 — 26%
2030 — 17% to 21% (PROJECTED)
FINDINGS
Canopy cover is not equitably distributed
FINDINGS
Canopy cover is not equitably distributed

POPULATIONS AT RISK

COMPARISON BETWEEN HEAT ISLAND AND CANOPY COVERAGE
Estimated ambient air temperature of a 90° F day
FINDINGS

Canopy cover is not equitably distributed
FINDINGS
Private property represents 72% of the total loss since 2009 and 58% of the total 2018 canopy.
FINDINGS

Areas with front yard setbacks have street trees in better condition

- **CITY AVERAGE**: 23% in good condition, 62% in fair condition
- **0 SETBACK**: 50% in good condition, 32% in fair condition
- **>0 AND <5' SETBACK**: 22% in good condition, 59% in fair condition
- **>5' SETBACK**: 18% in good condition, 69% in fair condition

Source: CUFMP 2018 canopy analysis and City GIS data.
FINDINGS
Urban canopy goes through cycles of boom and bust

Properties containing homes built around 1920 have an unusually high percentage of tree canopy
FINDINGS

Multiple factors impact the future condition of the forest

2030, 2050 and 2070 Baseline Scenario
- existing and potential pests and diseases
- temperature change and hardiness zone shift
- existing replanting and growth rates

2030 Flooding Scenario
- areas experiencing standing water > 24 hrs in a simulated 100 yr flood event

2050 Drought Scenario
- a moderate drought event projected to occur once every 30 years within the 2035 to 2064 timeframe (Hayhoe et al 2006)

Annual net loss rate in canopy models ranges from 1.8% to 3.2%.
The species composition of the future forest is influenced by susceptibility of individual species to climate risks, particularly pests and diseases.

**Flooding** was found to have a potentially **minimal impact** on the canopy.

**Drought** was found to have a potentially **moderate impact** on the existing tree canopy.
Core Concepts

To maintain, plan, build, and sustain a healthy, connective urban forest

1. Understand the forest as a living system
2. Value the forest as a public resource
3. Invest in canopy in the public realm
4. Share responsibility for a healthy forest
**APPROACH**
Draft goals and targets

**EQUITY**
- **Goal:** Minimum 25% cover per neighborhood
- **Target:** Each year, plant X* trees in neighborhoods deficient in canopy
- **Feasibility Analysis:**
  - Six neighborhoods do not currently meet the target. Will be difficult to achieve in East Cambridge.

**SHARED RESPONSIBILITY**
- **Goal:** City, residents, universities, developers all to increase their canopy cover by 10 to 25% by 2050
- **Target:** Each year, each constituent plants X* number of trees
- **Feasibility Analysis:**
  - There is enough plantable area to achieve this goal.

**RESILIENCE**
- **Human resilience goal:**
  1. 60% of sidewalks canopy covered.
  2. 50% reduction in the number of hotspots (92 degrees when 90 degree average) in the R.O.W.
- **Forest Resilience Goal:**
  - No more than 10% of a single species, 20% of a genus and 30% of a family.
- **Target:**
  - Each year, plant X* trees in the R.O.W.

*Planting target numbers will fluctuate depending on a number of factors such as neighborhood, constituent type, and most recent data on loss rates.*
EQUITY
Set a minimum canopy cover goal by neighborhood

- East Cambridge
- Area 2 / MIT
- The Port
- Wellington-Harrington
- Cambridgeport
- Riverside
- Mid-Cambridge
- North Cambridge
- Cambridge Highlands
- Agassiz
- Neighborhood Nine
- Strawberry Hill
- West Cambridge

25% Canopy Cover
EQUITY
Define priority planting areas
SHARED RESPONSIBILITY
Understand the importance of curbing loss to reaching 30% canopy cover

- CURB LOSS BY 0%
  - PLANT 4000 TREES PER YEAR

- CURB LOSS BY 25%
  - PLANT 3250 TREES PER YEAR

- CURB LOSS BY 50%
  - PLANT 2750 TREES PER YEAR
**SHARED RESPONSIBILITY**

Set targets for curbing loss and planting more trees

<table>
<thead>
<tr>
<th>Plant ___ Additional New Trees Per Year</th>
<th>Reduce Net Loss by ___%</th>
<th>Canopy Cover In 2030</th>
<th>Canopy Cover In 2050</th>
<th>Canopy Cover In 2070</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (do nothing scenario)</td>
<td>0%</td>
<td>22.8%</td>
<td>17.5%</td>
<td>13.5%</td>
</tr>
<tr>
<td>0</td>
<td>25%</td>
<td>23.5%</td>
<td>19.4%</td>
<td>15.9%</td>
</tr>
<tr>
<td>0</td>
<td>50%</td>
<td>24.3%</td>
<td>21.4%</td>
<td>18.7%</td>
</tr>
<tr>
<td>2,000</td>
<td>0%</td>
<td>23.4%</td>
<td>22.4%</td>
<td>24.0%</td>
</tr>
<tr>
<td>2,000</td>
<td>25%</td>
<td>24.2%</td>
<td>24.2%</td>
<td>26.4%</td>
</tr>
<tr>
<td>2,000</td>
<td>50%</td>
<td>24.9%</td>
<td>26.2%</td>
<td>29.2%</td>
</tr>
<tr>
<td>4,000</td>
<td>0%</td>
<td>24.0%</td>
<td>27.2%</td>
<td>34.5%</td>
</tr>
<tr>
<td>4,000</td>
<td>25%</td>
<td>24.8%</td>
<td>29.0%</td>
<td>36.9%</td>
</tr>
<tr>
<td>4,000</td>
<td>50%</td>
<td>25.5%</td>
<td>31.0%</td>
<td>39.7%</td>
</tr>
</tbody>
</table>
SHARED RESPONSIBILITY
Understand the relationship between loss rate and future canopy cover

- High range: planting 4000 trees/yr
- Low range: planting 3000 trees/yr
- 50% loss reduction
- 25% loss reduction
SHARED RESPONSIBILITY
Ask all parties to contribute to change
RESILIENCE
Shade the Public Realm

12,000 new Right of Way trees at maturity increase canopy cover from 26% to 27.5%* citywide

*Idealized scheme of R.O.W. planting, does not consider conflicts with utilities, etc. Source: and CUFMP 2018 canopy analysis.
RESILIENCE

Heat island as felt in 2018 is not evenly distributed

ESTIMATED AMBIENT AIR TEMPERATURE OF A 90°F DAY

Source: CCVA and CUFMP 2018 canopy analysis.
RESILIENCE

12,000 new ROW trees at maturity reduce heat island along important corridors

ESTIMATED AMBIENT AIR TEMPERATURE OF A 90°F DAY

Source: CCVA and CUFMP 2018 canopy analysis.
RESILIENCE

25% of the city would experience a 0.5°F or more decrease in temperature with 12,000 new trees.

Source: CCVA and CUFMP 2018 canopy analysis.
RESILIENCE

Cooling impact relative to streetscape (90 degree day)

Canopy %: <5%  30%  60%

A. 98 °F  B. 90 °F  C. 88 °F
RESILIENCE

Diversify the Cambridge forest to better withstand catastrophic events

TOTAL FOREST

30 % FAMILY
20% GENUS
10 % SPECIES

NORWAY MAPLE, HONEY LOCUST & PIN OAK
33% OF THE TOTAL FOREST

REMAINING TREES FOLLOWING CATASTROPHIC LOSS
17% CANOPY COVER CITY-WIDE
A menu of 47 strategies:

19 Policy
7 Design
9 Practice
12 Outreach & Education

**CURB LOSS + GROW CANOPY**
An all-of-the-above approach
**SUMMARY**

For projects requiring a special permit from the Planning Board or development projects subject to large project review (25,000 sq. ft. or more), the city’s tree protection ordinance provides certain protections. These protections only apply to “Significant Trees,” which are defined as trees greater than 8” DBH.

Other cities and towns locally and across the country offer protections for trees with a lower DBH. In particular, protections for trees with 6” DBH or greater is common.

**ANALYSIS**

The statistical sample of Cambridge’s tree population completed as part of this study found that of 4,118 trees inventoried, 41 percent measured greater than 8 inch DBH versus 60 percent which measured 6” DBH or greater. If the city were to redefine Significant Trees as 6” DBH or greater, this would increase the number of trees captured under the ordinance for the purposes of new or redevelopment by about 49 percent.

**IMPACT AREAS**

Increase front setback and open space requirements in priority areas through Zoning Ordinance

**POLICY STRATEGY 3B**

Various tree-related requirements and landscape mandates are currently scattered throughout City zoning. Most of these requirements are tied to narrowly defined site uses (such as parking facilities or townhouses) and limited districts (such as the Parkway or Prospect Street Overlay Districts).

The Zoning Ordinance also includes requirements for setbacks and open space, which have implications for the amount of area available for planting on sites, but do not specifically define the amount of planting required.

The concepts behind this strategy have been taken under consideration by the Resilient Zoning Task Force.

**ANALYSIS**

The City of Cambridge could increase the minimum front setback and open space requirements for all or certain zoning districts to increase the amount of space available for planting on lots. While many of the City’s residential districts have substantial requirements, most industrial and business districts in the city have little or no front setback and open space requirements.

This would not require the implementation of a new concept; rather it would simply involve a revision to the existing minimum requirements. The city could coordinate increased requirements to match the areas designated as “high priority” for planting and preservation. The City could customize enhanced planting areas based on building typology, land use, urban form, and other factors.

**IMPACT AREAS**

**PRECEDENTS**

National:
- Atlanta, Georgia
- Seattle, Washington
- Oakland, Florida
- Miami, Florida
- Anna, Texas

Local:
- Concord, Massachusetts
- Lexington, Massachusetts
- Brookline, Massachusetts

**PROS**

Increases the number of trees protected by the ordinance

Burdens large projects rather than individual residents or the City

**CONS**

Applies to more proposed development projects and thus requires additional city resources to review and approve plans

Adds cost to certain projects, including those which provide housing and other community values

**STRAATEGIES**

**Policy strategy 3B**

**Redefine Significant Trees to 6” DBH**

**IMPACT AREAS**

STEM LOSS GROW CANOPY

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**PRECEDENTS**

National:
- Baltimore, MD*
- Austin, TX*

*Note that these cities did not increase setbacks and open space requirements for the sole purpose of facilitating planting in high priority areas but did use sociodemographic and other factors to determine high priority planting areas.

**PROS**

Increases plantable area on new development sites

Targets high priority areas

**CONS**

Conflicts with other City goals of density and consistency with existing urban form

Require amendments to zoning, which is likely to be a complex political process

Places burdens on redevelopment projects

Applies only to new development and construction projects, having impact only over the long term

STRATEGIES
Policy strategy 3B

POLICY STRATEGY 3B

Increase front setback and open space requirements in priority areas through Zoning Ordinance

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Places burdens on redevelopment projects
Applies only to new development and construction projects, having impact only over the long term
STRATEGIES
Policy strategy 3A

POLICY STRATEGY 3A

Establish canopy coverage requirements by parcel through Zoning Ordinance

IMPACT AREAS

PRECEDENTS
National:
Chapel Hill, NC
Providence, RI
Manassas, VA
Augusta, GA

SUMMARY
Today, Cambridge has 26 percent of its land area covered by canopy. Between 2009 and 2018, the canopy declined on average by 16.4 acres every year. At this rate, canopy cover will be 21.6 percent in 2030.

This is also a time period in which significant redevelopment has taken place, and long-term plans such as Envision Cambridge are currently setting out a vision for the next areas of significant development. Zoning is the most effective way to influence development, but currently Cambridge zoning has little specific direction about trees or canopy cover.

The concepts behind this strategy have been taken under consideration by the Resilient Zoning Task Force.

ANALYSIS
If the City amended the Zoning Ordinance to require specific canopy coverage percentages by land use or district, future development would be structured to contribute to overall City-wide goals. Emphasis or higher percentages could be applied to priority areas such as canopy corridors through an overlay district. If cover requirements were to apply citywide, they could be incorporated into the existing requirements/standards for open space or established as a separate minimum requirement alongside the existing setback and open space requirements applied to each zoning district and land use type.

<table>
<thead>
<tr>
<th>Land Use Type</th>
<th>2016 Acres of Land Use</th>
<th>2016 Canopy Cover</th>
<th>Canopy Cover Target (DRAFT)</th>
<th>Plantable Area (not currently canopy covered)</th>
<th>New Canopy Area (new canopy cover targets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential - no setbacks</td>
<td>192</td>
<td>16%</td>
<td>26%</td>
<td>44</td>
<td>17</td>
</tr>
<tr>
<td>Residential - setbacks</td>
<td>1383</td>
<td>29%</td>
<td>35%</td>
<td>440</td>
<td>86</td>
</tr>
<tr>
<td>Institutional</td>
<td>436</td>
<td>20%</td>
<td>30%</td>
<td>111</td>
<td>44</td>
</tr>
<tr>
<td>Commercial/Industrial</td>
<td>538</td>
<td>9%</td>
<td>15%</td>
<td>126</td>
<td>34</td>
</tr>
</tbody>
</table>

PROS
- Creates more consistency and predictability for property owners and developers
- Focuses coverage goals in high priority areas
- Targets areas where canopy growth is most appropriate

CONS
- Conflicts with competing priorities in the zoning/development processes
- Requires amendments to zoning, which is likely to be a complex process
- Applies only to new development and construction projects, having impact only over the long term
**STRATEGIES**

**Design strategy 2C**

**DESIGN STRATEGY 2B**

**Plant bare root trees in expanded and enhanced tree ways where possible**

**SUMMARY**

Street trees establish more quickly and survive longer, especially in the face of drought conditions, when they have larger soil volumes. In cases where the back of sidewalk condition is pervious, it is beneficial for the long term health of the tree to connect the tree pit soil to the back of the sidewalk, providing a larger continuous soil volume for the roots to access.

**ANALYSIS**

Unless infeasible, the City should improve planting pits before installing new trees. New or amended soils should be placed in the open tree pit, with structural soils under sidewalks for root growth into adjacent areas. Bare root trees are field grown and shipped without soil around the roots. Bare root trees are recommended over balled and burlapped trees due to the ability to plant a larger number of bare root trees and bare root trees being quicker to establish.

**PROS**

- Improves establishment success and life-span
- Provides a strategy that is replicable across many sites

**CONS**

- Requires additional investment in each replanting
- Requires more protection as bare root trees are more susceptible to damage

**IMPACT AREAS**

- STEM LOSS
- GROW CANOPY
**DESIGN STRATEGY 2C**

**Narrow sidewalks: reduce roadway to increase planting**

**RESIDENTIAL STREETS**

**EXISTING:**
Narrow residential streets with no setback

**PROPOSED:**
Remove street pavement by shifting two-way traffic to one-way; push the curb out to get a wider planting zone

<table>
<thead>
<tr>
<th><strong>PROS</strong></th>
<th><strong>CONS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>New space and soil volume for tree planting</td>
<td>Reduced connectivity for vehicle traffic (one way)</td>
</tr>
<tr>
<td>More livable street</td>
<td>The cost of redesigning the street</td>
</tr>
<tr>
<td>Healthier trees due to greater soil volume</td>
<td>Utility conflicts</td>
</tr>
</tbody>
</table>

**IMPACT AREAS**

- STEM LOSS
- GROW CANOPY

**EXISTING**

**PROPOSED**
DESIGN STRATEGY 2C

Average sidewalks: create planting area in parking spots

EXISTING: Narrow residential streets with front yards

PROPOSED: Turn some parking spaces into green spaces to plant trees

PROS
- Creates more space for trees
- Reduces impervious area

CONS
- Reduces parking space
- The cost of redesigning the street
- Utility conflicts

IMPACT AREAS

EXISTING

PROPOSED

PRECEDEnts
Western Avenue, Cambridge
San Francisco
**DESIGN STRATEGY 2C**

**Wide sidewalks: integrate bike lanes and tree plantings**

**COMMERCIAL STREETS**

EXISTING: Major commercial streets with a wide sidewalk, parking and bike lane

PROPOSED: Relocate the curb, move the bike lane off the street and increase the soil volume

**PROS**

- Incentivizes biking by providing a safer bike lane
- Expands continuous soil volume

**CONS**

- Requires complex utility coordination
- The cost of redesigning the street

**IMPACT AREAS**

- STEM LOSS
- GROW CANOPY

**EXISTING**

- Wide sidewalks
- Bike lanes
- Tree plantings

**PROPOSED**

- Relocated curb
- Move bike lane off the street
- Increased soil volume
PRACTICE STRATEGY 2B

Implement structural pruning for young trees

SUMMARY
The City does not currently conduct structural pruning for young trees and this represents a significant opportunity to improve the long term health of street and park trees.

ANALYSIS
Structural pruning is a type of pruning typically performed on young to middle-aged shade and ornamental trees. The objective is to create a strong and healthy structure so that trees are sturdier under wind, snow and ice loads, and less prone to failures, and so they can live full and useful lives in the landscape. The sooner in the life of the tree that structural pruning is started, the easier and less expensive it is. Waiting until the tree is mature often means larger more disfiguring pruning cuts, cabling and much greater expense.

IMPACT AREAS

- STEM LOSS
- GROW CANOPY

PROS
- Avoided long term costs

CONS
- New operational costs
**Practice Strategy 2A**

**Establish a soils management program**

**SUMMARY**
Currently the City mulches some of its trees on a regular basis, which is a good way to support organic matter renewal and good soil function. The City has also begun to monitor the impact of salts on street tree soil.

Implementing a program to improve soils health represents an important opportunity to reduce tree mortality and increase canopy growth.

**ANALYSIS**
Injecting liquid biological amendments (compost tea) is an effective method of improving and maintaining soil health. The City is currently in the process of establishing an in-house liquid biological amendment program to treat all newly planted trees. Long term, the City could develop the capacity to treat all street trees once a year on a two year cycle.

**IMPACT AREAS**

<table>
<thead>
<tr>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased survival rates</td>
<td>Cost, primarily for staff time</td>
</tr>
</tbody>
</table>

**STEM LOSS**

**GROW CANOPY**
Strategies
Practice strategy 2C

**PRACTICE STRATEGY 2C**

**Expand watering program**

**SUMMARY**
Water availability is the primary determinant of tree health. Providing sufficient water during establishment, when roots are expanding to find additional sources of water is critical to their long term success.

The current tree contract requires the contractor to water newly planted trees for three years, and the City currently utilizes the Tree Ambassador program to water trees for two summers following this initial three year period.

**ANALYSIS**
Given the increased planting targets, the City will need to increase its watering program to cover an increased number of new trees. In addition, the City should consider emergency watering during drought.

| IMPACT AREAS |
| STEMLoss | GROW CANOPY |

**PROS**
- Increased survival rates

**CONS**
- Increased labor hours
PRACTICE STRATEGY 3

Establish a gravel bed nursery

SUMMARY
With municipal tree planting, especially at large scale, there is an inevitable holding period between digging and acquiring the trees and planting them. Balled and burlapped trees are less likely to survive if they have extended periods out of the ground, so their planting season is constrained to a few weeks in spring and a few in the fall. If cared for properly, bare root trees enjoy the benefit of an extended planting season. Root dessication is the most critical disadvantage to planting bare root trees, however, proper care in a gravel bed nursery mitigates the risk.

ANALYSIS
A gravel bed is an irrigated bed of gravel to place and safely hold bare root or washed containerized stock (aka “heeling in”) for up to 3-6 months. Doing this dramatically increases fibrous root volume, decreasing transplant shock and increasing survivability of the plant. Since bare root stock is typically only available during spring, this also allows for staged plantings throughout the year.

8,200 sf of space is required to store 456 bare root trees

PROS
- Increases root mass at planting
- Increases survival rates
- Extends planting season

CONS
- Initial capital outlay to build beds

IMPACT AREAS

STEM LOSS  GROW CANOPY

PRECEDENTS
- PHS, Philadelphia
- Various municipalities in Minnesota
Outreach and education strategy 4B

Support community tree planting efforts

**SUMMARY**
Supporting community tree planting efforts may lead citizens to work together and create more energy and momentum behind planting trees. This may result in groups advocating and planting trees within neighborhoods that are underserved today.

**PRECEDENT**
Keep Indianapolis Beautiful is a nonprofit organization. They offer a community forestry program which residents can apply for tree planting if they find at least 20 spots for trees in their neighborhood. Applicants need to form a small group and need to agree with their neighbors and local business owners to commit to tree preservation.

**PRECEDENTS**
Keep Indianapolis Beautiful
STRATEGIES
Outreach and education strategy 1C

OUTREACH AND EDUCATION STRATEGY 1C

SUMMARY
Businesses can help protect the forest by ensuring all wood products are pest free by using ISPM 15 regulated wood packaging material in international trade.

ANALYSIS
In 2008, the Asian Longhorn Beetle was found in Worcester, MA, presumably brought in through wood pallets. The city lost 35,000 trees either killed by the beetle or felled by foresters working to contain the infestation.

The ISPM 15 standard describes phytosanitary measures that reduce the risk of introduction and spread of quarantine pests associated with the movement in international trade of wood packaging material made from raw wood.

Educate local businesses about the dangers of pest outbreaks

IMPACT AREAS

STEM LOSS GROW CANOPY
STRATEGIES
Outreach and education strategy 1B

OUTREACH AND EDUCATION STRATEGY 1B

Organize tree tours for citizens to engage with trees

SUMMARY
Organizing tree tours could foster good working relationships between the community and DPW. This is something that the City has implemented in the past but currently is not in practice.

ANALYSIS
There are examples of guided walking and biking tree tours in neighborhoods and parks in various cities. For example, the City of Chesapeake, Virginia, organizes guided tours once every season, or four times a year. There are also self-guided tours that allow citizens to access a tree map by using smartphones in some cities such as Seattle (Tree Walk app), Nevada City, Sacramento, and Atlanta.

PRECEDENTS
Friends of the Urban Forest, San Francisco
Tree Walk app, Seattle
STRAATEGIES
Outreach and education strategy 2B

OUTREACH AND EDUCATION STRATEGY 2B

Publish annual reports to document progress

SUMMARY
A yearly report card that evaluates the efforts to expand the urban forest can remind citizens of the state of the forest, communicate the goals of this report, and hold communities accountable for reaching their goals.

PRECEDENTS
Tree Report Card, Washington, D.C.
Cambridge MA Annual Drinking Water Quality Report

ANALYSIS
As an example, Casey Trees’ tree report card rates Washington DC’s urban forest based on four metrics: Tree coverage, tree health, tree planting and tree protection. It also compares previous years’ grades. As with the Cambridge Water Department’s Drinking Water Quality Report, the Urban Forest report card could be mailed to all residents.
DEcision Making Process
Regular evaluation and prioritization

**Framework**
Forests are dynamic systems with cycles of loss and renewal.

**Values**
- Equity
- Resilience
- Shared responsibility

**Goals**
- 25% minimum cover per neighborhood
- 10 to 25% additional canopy by type
- 60% canopy cover over sidewalks
- 50% reduction of heat island hotspots
- 90% canopy city-wide

**Toolbox**
- Policy
- Practice
- Design

**Evaluate Comprehensively (5 Year Cycle)**
- Canopy loss/gain
- Distribution
- Species diversity
- Health (trees & soils)

**Evaluate Progress (Annual Cycle)**
- New plantings (quantity)
- Initiatives (engagement)
- Practices (practicality)

**Keep Pace with Current Research (Ongoing)**
- Horticultural and climate science updates

**Define Priorities**
- Advance equity
- Reduce heat island
- Shade public realm

**Partner & Communicate**
- Build social infrastructure
- Educate and energize

**Evaluate Cambridge**
- Urban form typologies
- Populations at risk

**Set / Adjust Targets**
- City to plant ~1000 street trees per year
- Private entities to plant ~2000 to 3000 trees per year

**Select / Prioritize Strategies**
The current moratorium sunsets in March.

The following concepts are not specific proposals but represent alternative strategies to be considered.

Each strategy has different impacts and potential consequences.
Trees are a shared resource

Trees provide benefits to the city

Not all trees are equal

Replanting in kind is preferred, but not all sites and project types are the same

The process should be simple and objective

The process should be equitable
TREE PROTECTION ORDINANCE

Proposed items to include

**Commit**
Specifically state the City’s commitment to the goals of the UFMP
(use the Cambridge bike safety ordinance as a model)

**Defend**
Add language to guard against pruning a tree so as to intentionally shorten its life

**Fund**
Enable the Tree Fund to be used in more flexible ways
Establish a Tree Trust to give grants for planting on private property
Tree Protection Ordinance

Competing interests

discourage removals

encourage planting
Everyone should be subject to the ordinance
All property types are under the jurisdiction of the ordinance

Protect more trees
All trees over 6” dbh are covered by the ordinance (currently 8”)

Protect the largest trees
Increase mitigation for larger trees

Ensure equitable application of the ordinance
Exempt those on federal assistance from any fees

Encourage replanting on private property
Expand the uses of mitigation funds
(create a Tree Trust that can plant on private property)
IN ALL CASES
Always allow removal of dead or hazardous trees

1. Get Arborist evaluation
2. File permit
3. Receive approval / No mitigation required
4. Receive free replacement if desired
**VOLUNTARY REMOVAL STRATEGY 1**

Replace trees One for One

1. File permit
2. Replant on site *or*
   Pay to support replanting elsewhere
3. Receive free replacement
   if on assistance

Notes:
- arborist evaluation is not required
- all trees are treated equally,
  no special protections for large trees
VOLUNTARY REMOVAL STRATEGY 2
Replace trees based on size

1. File permit
2. Replant on site
3. Receive free replacement if on assistance

Notes:
— arborist evaluation is not required
— larger trees require increased mitigation
— health and location are not considered
VOLUNTARY REMOVAL STRATEGY 2
Replace trees based on size

1. File permit
2. Pay to support replanting elsewhere
3. Receive free replacement if on assistance

Notes:
— arborist evaluation is not required
— larger trees require increased mitigation
— health and location are not considered
VOLUNTARY REMOVAL STRATEGY 2
Replace trees based on size

1. File permit
2. Replant on site and
   Pay to support replanting elsewhere
3. Receive free replacement if on assistance

Notes:
— arborist evaluation is not required
— larger trees require increased mitigation
— health and location are not considered
VOLUNTARY REMOVAL STRATEGY 3
Value trees based on trunk area formula

40” diameter = (8) 5” Trees

Replacing trees by “caliper inch”

(64) 5” Trees

Replacing trees by “trunk area”
1. Get arborist assessment
2. File permit
3. Pay to support replanting elsewhere

Notes:
- arborist evaluation is required
- mitigation increases with size
- species, health, location are modifying factors

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**VOLUNTARY REMOVAL STRATEGY 3**
Value trees based on trunk area formula

\[
\text{VALUE} = \text{TYPICAL REPLACEMENT $/ SQ IN} \times \text{APPRaised SQ. IN.} \times \text{SPECIES RATING} \% \times \text{CONDITION RATING} \% \times \text{LOCATION RATING} \%
\]
Summary of Strategies

**STRATEGY 1**
- Remove a tree
- Replace on the property

**STRATEGY 2**
- Remove a tree
- Fund
- Metric
- Replacement cost
- Inherent value
- Discourage removal

**STRATEGY 3**
- Replace on the property
- Fund
- Metric
- Encourage planting
- Impact
- Discourage removal

**PROCESS**
- Simple
- Complex
SUMMARY OF TECHNICAL REPORT

NEXT STEPS

Q & A

OPEN HOUSE
The consultants will take the Task Force and public comments under advisement and develop a Master Plan document that prioritizes action strategies from the Technical Report for immediate and longer term implementation.
SUMMARY OF TECHNICAL REPORT

NEXT STEPS

Q & A

OPEN HOUSE

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